

### **REMARKS/ARGUMENTS**

In the Advisory Action mailed March 1, 2007, Applicants respectfully note that the Examiner has not addressed Applicants' arguments regarding why Applicants respectfully believe that there would be no motivation to include the Bragg grating sensor of Hay in Haake. Applicants respectfully note that the Examiner's rejections of the independent claims in this application are based on this combination of references and the Examiner has not addressed Applicants' arguments regarding this combination. In the Advisory Action, Applicants respectfully submit that the Examiner has only discussed what he believed was the "thrust" of Applicants' arguments, and has not addressed Applicants' arguments regarding the propriety of the Examiner's argued combination of these references in his obviousness rejections.

In this Amendment, Applicants have amended independent claims 1 and 12 to even more-particularly claim Applicants' invention and to distinguish over the cited references. Applicants have amended the claims to more-particularly claim the feature of the recess having a breadth and depth matched to a diameter of the optical fiber. In the Advisory Action, it appears that the Examiner was broadly interpreting the claims such that this feature did not mean that only the diameter of the fiber can fit within the groove, even though Applicants' disclosure provides no disclosure for a breadth and depth such that the required metallic material 18 of Haake could be fit within the groove. Therefore, Applicants have more-particularly defined that the recess' breadth and depth is matched to a diameter of the optical fiber such that no metallic material is included in the recess. Applicants respectfully submit that since Haake requires the metallic material, for at least this reason, claims 1 and 12 further distinguish over Haake, even if Haake can be combined with Hay.

In Applicants' invention, the recess in the surface of the workpiece has a breadth and depth matched to a diameter of the optical fiber arranged in the recess, as now even more-particularly claimed, because the Bragg grating optical fiber sensor that is arranged in the recess is used for the claimed measuring

arrangement for testing workpieces (claim 1) and the claimed method for metrological instrumentation of workpieces (claim 12). Thus, as claimed and as disclosed in Applicants' specification at least at page 5, lines 5-8, the breadth and depth of the recess is "consequently" matched to the diameter of the Bragg grating optical fiber sensor. Applicants respectfully submit that even if Haake discloses a groove 40 as a recess in a workpiece, that the groove does not have a breadth and depth matched to a diameter of the optical fiber 16 since the groove also contains a metallic material 18.

In Haake, as can be clearly seen in Figure 5 and as disclosed at col. 8, lines 57-63, the breadth and depth of the groove 40 must be formed larger than the diameter of the fiber 16 because molten metallic material 18 must also be applied in the groove. The molten metallic material 18 is used to affix the fiber 16 in the groove 40. With the structure of Haake, a fracture in the metallic workpiece will also fracture the metallic material 18 and damage the fiber 16, which is also surrounded by a metal coating 34, such that the fracture can be detected.

Thus, Applicants respectfully submit that Haake does not disclose Applicants' claimed invention where the recess in the workpiece has a breadth and depth matched to a diameter of the optical fiber, as now even more particularly claimed by Applicants. In Haake, the distance between the fiber and the groove is considerable in breadth and depth. This is so because in Haake, the molten metallic material 18 is filled in the groove and the metal coated fiber is disposed in the molten metallic material. In Applicants' invention, the recess has a breadth and depth matched to a diameter of the optical fiber because no molten metallic material is used with the Bragg grating sensor. Therefore, for at least this reason, Applicants respectfully submit that claims 1 and 12 are allowable over Haake and Hay. Hay does not cure the deficiencies in Haake discussed above.

Further, as discussed above, Applicants also respectfully traverse the Examiner's argument that it would have been obvious to include the Bragg

grating sensor of Hay in Haake. Applicants respectfully submit that there would be no motivation to include such a sensor in Haake and, as also discussed above, Applicants respectfully note that the Examiner has not addressed Applicants' arguments in the Advisory Action. Applicants respectfully request that if the Examiner disagrees with Applicants' arguments, that the Examiner specifically point out the deficiencies in Applicants' arguments so that Applicants can consider the Examiner's position.

In Applicants' invention, a Bragg grating sensor is used because, as discussed above, the invention is used for the claimed measuring arrangement for testing workpieces (claim 1) and the claimed method for metrological instrumentation of workpieces (claim 12). For this claimed testing and metrological instrumentation, the Bragg grating sensor is positioned within a recess that has a breadth and depth matched to a diameter of the fiber. No molten metallic material is used. Clearly, Haake alone cannot disclose these features of Applicants' invention. Applicants also respectfully submit that there would be no motivation to include the Bragg grating sensor of Hay in Haake. There would be no need to. In Haake, as taught, a fracture in the workpiece results in damage to the fiber 16. "[T]he resulting damage to the fiber optic element 16 itself will attenuate the transmitted light such that the fracture in the workpiece may be detected." Col. 6, lines 4-8. Thus, all that is required in Haake is that a fiber be damaged as a result of a fracture of the workpiece so that the fracture can be detected. Applicants respectfully submit there would be no motivation to include a Bragg grating sensor in Haake for this purpose.

Further, even if a Bragg grating sensor could physically be included in Haake, Applicants respectfully submit that such a sensor could not serve the purpose argued by the Examiner in the Office Action. The Examiner argues that including such a sensor "would allow for improved sensitivity of transmission of force fluctuations to the sensors." First, Applicants respectfully submit that the optical fiber in Haake does not have a purpose of detecting transmission of force

fluctuations. It is used to detect a fracture in the workpiece. Thus, there is no need for "improved sensitivity of transmission of force fluctuations" in Haake.

Further, Applicants respectfully submit that including the Bragg grating sensor of Hay in Haake **could not serve** the purpose argued by the Examiner. In Haake, the Bragg grating sensor would be included in the molten metallic material. As disclosed in Haake, this material "has a relatively large coefficient of thermal expansion such that the metallic material 18 in the underlying workpiece will expand and contract similarly during temperature fluctuations..." Col. 7, lines 13-16. Thus, Applicants respectfully submit that including a Bragg grating sensor of Hay in molten metallic material of Haake that expands and contracts along with the workpiece could not have the purpose argued by the Examiner of improved sensitivity of transmission of force fluctuations. Again, in Haake, the optical fiber does not have such a purpose. It merely is used to detect a fracture of the workpiece by becoming damaged itself as a result of the fracture.

Further yet, Applicants respectfully submit that one of ordinary skill in the art would not understand the teachings of Hay for a bolt, stud or fastener with a Bragg grating sensor arranged inside a central bore of the bolt, stud or fastener to apply to a recess introduced into a surface of a workpiece. Hay specifically teaches that "the fact that [the optical fiber] is inserted into the center of the shank 13, the strength of the shank 13 is not compromised." See col. 3, lines 34-36. (emphasis added). Therefore, Applicants respectfully submit that Hay **teaches against** including a Bragg grating sensor in a surface of a workpiece.

Therefore, Applicants respectfully submit that independent claims 1 and 12 are allowable for at least these additional reasons over Haake and Hay.

Further in this Amendment, Applicants have added new claims 21-28 to more-particularly claim Applicants' invention. Applicants respectfully submit that these features of Applicants' invention are disclosed in Applicants' specification at least at page 5, lines 17-25 and page 6, lines 4-9 and 16-17.

Appl. No. 10/646,708  
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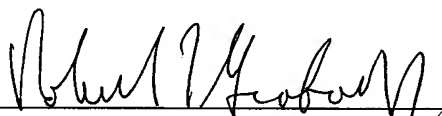
Applicants respectfully submit that the application is now in condition for allowance with claims 1, 5-12, 15, 17, and 19-28 being allowable.

If there are any questions regarding this Amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned. As provided for above, this paper should be considered as a Petition for Extension of Time. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket No. 011235.52686US).

Respectfully submitted,

CROWELL & MORING LLP

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By   
Robert L. Grabarek, Jr.  
Reg. No. 40,625  
Tel.: (949) 263-8400 (Pacific Coast)

Intellectual Property Group  
P.O. Box 14300  
Washington, D.C. 20044-4300